

REMARKS/ARGUMENT

Claims 5, 12 and 19 have been amended better to define the invention and overcome the 35 U.S.C. 112, second paragraph, rejection.

Applicant has not amended Claims 6, 13 or 20 as requested by the Examiner since Applicant is unaware of any statute or law requiring recitation of structure with any recitation of function. Claims 6, 13 and 20 clearly state the interconnection between the elements recited in the body of the claims. A complete and clear apparatus is recited. Even MPEP 706.03(d) paragraph 7.34.01 (Examiner's Note) specifically states: "If the scope of the claimed subject matter can be determined by one having ordinary skill in the art, a rejection using this form paragraph would not be appropriate".

Applicant cites two Supreme Court cases in which the Court held that it is not necessary to recite in the claim everything necessary to operate the device. As stated by Joseph Gray Jackson in *The Art of Drafting Patent Claims*, 59-60:

In Deering v. Winona, 155 U.S. 286 (1894), the device was an agricultural machine and lacked the support necessary for the board which was an element of the claim. The Supreme Court, said, "True that it is necessary and true it is not in the claim but it does not have to be; the claim does not have to include everything that is required to operate."

The other case is Special Equipment v. Coe, 324 U.S. 370, 64 USPQ 525 (1945), in which a subcombination claim was supported which related to a machine for cutting, peeling and coring pears, and there was no cutting knife involved in the claim. The Supreme Court said it is perfectly all right; you do not have to have everything required to operate this device in the claim. Completeness is a much inflated "bugaboo" which is mainly of interest to certain examiners in the Patent Office, and should not really concern them. The claim is not a description of the device in any case. It is like a fingerprint which identifies the device. The fingerprint looks not at

all like the person, but it is an identification of the person, and that is what we are interested in - identification.

1) Claims 1-14 stand rejected under 35 U.S.C. 102(b) as being anticipated by Suter et al. [5,831,883]. Applicant respectfully traverses this rejection, as set forth below.

In order that the rejection of Claims 1-14 be sustainable, it is fundamental that “each and every element as set forth in the claim be found, either expressly or inherently described, in a single prior art reference.” *Verdegall Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). See also, *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989), where the court states, “The identical invention must be shown in as complete detail as is contained in the ... claim”.

Furthermore, “all words in a claim must be considered in judging the patentability of that claim against the prior art.” *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

Independent Claim 1, as amended, requires and positively recites, a fast Fourier transform (FFT) architecture, comprising: “a pipeline segment having a plurality of data-independent pipelines **that receive different time-domain data samples** and generate therefrom corresponding intermediate results” and “a parallel segment, coupled to all of said pipelines, that receives said corresponding intermediate results and **generates therefrom corresponding frequency-domain results**”.

Independent Claim 8, as amended, requires and positively recites, a method of performing a fast Fourier transform (FFT), comprising: “initially **receiving different time-domain data samples** into a plurality of data-independent pipelines of a pipeline segment, said data-independent pipelines generating therefrom corresponding intermediate results” and “subsequently receiving said corresponding intermediate results

into a parallel segment coupled to all of said pipelines, said parallel **segment generating therefrom corresponding frequency-domain results**".

In contrast, while Suter discloses an N-point fast Fourier transform employing mathematically justified manipulation of input data, multirate, parallel and asynchronous circuit techniques, there is nothing in Suter's Figure 1 (or the remainder of the drawings or the specification) that teaches that elements 110, 120 and 140 output "a pipeline segment having a plurality of data-independent pipelines **that receive different time-domain data samples** and generate therefrom corresponding intermediate results", as required by Claim 1 or "initially **receiving different time-domain data samples** into a plurality of data-independent pipelines of a pipeline segment, said data-independent pipelines generating therefrom corresponding intermediate results", as required by Claim 8.

Further, there is no teaching in Suter's Figure 1 (or the remainder of the drawings or the specification) that elements 141, 150 and 160 are "a parallel segment, coupled to all of said pipelines, that receives said corresponding intermediate results and **generates therefrom corresponding frequency-domain results**", as further required by Claim 1, OR "subsequently receiving said corresponding intermediate results into a parallel segment coupled to all of said pipelines, said parallel **segment generating therefrom corresponding frequency-domain results**", as further required by Claim 8.

In light of the above, it should be clear that that each and every element of Claim 1 and 8 are NOT found expressly, or inherently, in the Suter reference, as is required by law for a valid 35 U.S.C. 102(b) rejection. See, *Verdegall Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). See also, *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989)". Accordingly, the 35 U.S.C. 102(b) rejection of Claims 1 and 8 over Suter must be withdrawn

Indeed, in light of the above, Applicant respectfully suggests that all the words of Claims 1 and 8 have not been considered by the Examiner, in judging the patentability of that claim against the Suter reference, as is also required by law. See, *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

In the event the Examiner affirms his rejection, Applicant requests that the Examiner specifically point out where Suter teaches “time-domain samples” and “frequency-domain results”.

Claims 2-7 stand allowable as depending directly from allowable Claim 1 and by including further limitations not taught or suggested by the reference of record. Claims 9-14 stand allowable as depending directly from allowable Claim 8 and by including further limitations not taught or suggested by the reference of record.

Claim 2 further defines the architecture as recited in Claim 1 wherein each of said plurality of data-independent pipelines receives a single time-domain data sample at a time. Claim 2 depends from Claim 1 and is therefore allowable for the same reasons set forth above for the allowance of Claim 1.

Claim 3 further defines the architecture as recited in Claim 1 wherein each of said data-independent pipelines is a radix-2² single-path delay feedback pipeline. Claim 3 depends from Claim 1 and is therefore allowable for the same reasons set forth above for the allowance of Claim 1.

Claim 4 further defines the architecture as recited in Claim 1 wherein said parallel segment is a radix-2 segment. Claim 4 depends from Claim 1 and is therefore allowable for the same reasons set forth above for the allowance of Claim 1.

Claim 5 further defines the architecture as recited in Claim 1 wherein a number of said plurality of data-independent pipelines for a particular application is based on both a time-domain data sample rate and a clock rate pertaining to said application. Claim 5 depends from Claim 1 and is therefore allowable for the same reasons set forth above for the allowance of Claim 1.

Claim 6 further defines the architecture as recited in Claim 1 wherein a strength reduction transformation is employed to substitute real multipliers for complex multipliers. Claim 6 depends from Claim 1 and is therefore allowable for the same reasons set forth above for the allowance of Claim 1.

Claim 7 further defines the architecture as recited in Claim 1 wherein said pipeline segment employs a hardware implementation. Claim 7 depends from Claim 1 and is therefore allowable for the same reasons set forth above for the allowance of Claim 1.

Claim 9 further defines the method as recited in Claim 8 wherein each of said plurality of data-independent pipelines receives a single time-domain data sample at a time. Claim 9 depends from Claim 1 and is therefore allowable for the same reasons set forth above for the allowance of Claim 1.

Claim 10 further defines the method as recited in Claim 8 wherein each of said data-independent pipelines is a radix-2² single-path delay feedback pipeline. Claim 10 depends from Claim 1 and is therefore allowable for the same reasons set forth above for the allowance of Claim 1.

Claim 11 further defines the method as recited in Claim 8 wherein said parallel segment is a radix-2 segment. Claim 11 depends from Claim 1 and is therefore allowable for the same reasons set forth above for the allowance of Claim 1.

Claim 12 further defines the method as recited in Claim 8 wherein a number of said plurality of data-independent pipelines for a particular application is based on both a time-domain data sample rate and a clock rate pertaining to said application. Claim 12 depends from Claim 1 and is therefore allowable for the same reasons set forth above for the allowance of Claim 1.

Claim 13 further defines the method as recited in Claim 8 wherein a strength reduction transformation is employed to substitute real multipliers for complex multipliers. Claim 13 depends from Claim 1 and is therefore allowable for the same reasons set forth above for the allowance of Claim 1.

Claim 14 further defines the method as recited in Claim 8 wherein said pipeline segment employs a hardware implementation. Claim 2 depends from Claim 1 and is therefore allowable for the same reasons set forth above for the allowance of Claim 1.

2) Claims 1-14 stand rejected under 35 U.S.C. 102(b) as being anticipated by Jaber et al. [6,792,441 B2] and Nakazuru et al [US 2004/0039765 A1]. Applicant respectfully traverses this rejection, as set forth below.

In order that the rejection of Claims 1-14 be sustainable, it is fundamental that “each and every element as set forth in the claim be found, either expressly or inherently described, in a single prior art reference.” *Verdegall Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). See also, *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989), where the court states, “The identical invention must be shown in as complete detail as is contained in the ... claim”.

Furthermore, "all words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

Independent Claim 1, as amended, requires and positively recites, a fast Fourier transform (FFT) architecture, comprising: “a pipeline segment having a plurality of data-independent pipelines **that receive different time-domain data samples** and generate therefrom corresponding intermediate results” and “a parallel segment, coupled to all of said pipelines, that receives said corresponding intermediate results and **generates therefrom corresponding frequency-domain results**”.

Independent Claim 8, as amended, requires and positively recites, a method of performing a fast Fourier transform (FFT), comprising: “initially **receiving different time-domain data samples** into a plurality of data-independent pipelines of a pipeline segment, said data-independent pipelines generating therefrom corresponding intermediate results” and “subsequently receiving said corresponding intermediate results

into a parallel segment coupled to all of said pipelines, said parallel **segment generating therefrom corresponding frequency-domain results**".

In contrast, while Jaber teaches that a discrete Fourier transform (DFT) is computed in a plurality of parallel processors, there is no teaching in Jaber that elements 904A and 904B in Figure 9 (or any other figure or portion of the specification) disclose or teach "a pipeline segment having a plurality of data-independent pipelines **that receive different time-domain data samples** and generate therefrom corresponding intermediate results", as required by Claim 1 or "initially **receiving different time-domain data samples** into a plurality of data-independent pipelines of a pipeline segment, said data-independent pipelines generating therefrom corresponding intermediate results", as required by Claim 8.

Further, there is no teaching in Jaber that elements 916 and 918 in Figure 9 (or any other figure or portion of the specification) disclose or teach "a parallel segment, coupled to all of said pipelines, that receives said corresponding intermediate results and **generates therefrom corresponding frequency-domain results**", as further required by Claim 1, OR "subsequently receiving said corresponding intermediate results into a parallel segment coupled to all of said pipelines, said parallel **segment generating therefrom corresponding frequency-domain results**", as further required by Claim 8.

Similarly, while Nakazuru teaches a Fourier transform apparatus whose pipeline width is independent of transform point number of individual pipeline FFT circuits in each stage and composed of a preceding stage and a succeeding stage, there is no teaching in Nakazuru that element 1 in Figure 1 (or any other figure or portion of the specification) disclose or teach "a pipeline segment having a plurality of data-independent pipelines **that receive different time-domain data samples** and generate therefrom corresponding intermediate results", as required by Claim 1 or "initially **receiving different time-domain data samples** into a plurality of data-independent

pipelines of a pipeline segment, said data-independent pipelines generating therefrom corresponding intermediate results”, as required by Claim 8.

Further, there is no teaching in Nakazure that elements 4, 7 and 2 in Figure 1 (or any other figure or portion of the specification) disclose or teach “a parallel segment, coupled to all of said pipelines, that receives said corresponding intermediate results and **generates therefrom corresponding frequency-domain results**”, as further required by Claim 1, OR “subsequently receiving said corresponding intermediate results into a parallel segment coupled to all of said pipelines, said parallel **segment generating therefrom corresponding frequency-domain results**”, as further required by Claim 8.

In light of the above, it should be clear that that each and every element of Claim 1 and 8 are NOT found expressly, or inherently, in the Jaber OR Nakazuru references, as is required by law for a valid 35 U.S.C. 102(b) rejection. See, Verdegall Bros. v. Union Oil Co. of California, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). See also, Richardson v. Suzuki Motor Co., 9 USPQ2d 1913, 1920 (Fed. Cir. 1989)”. Accordingly, the 35 U.S.C. 102(b) rejection of Claims 1 and 8 over Jaber and Nakazuru must be withdrawn

Indeed, in light of the above, Applicant respectfully suggests that all the words of Claims 1 and 8 have not been considered by the Examiner, in judging the patentability of that claim against the Jaber and Nakazuru references, as is also required by law. See, In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

In the event the Examiner affirms his rejection, Applicant requests that the Examiner specifically point out where Jaber and Zakazuru teach “time-domain samples” and “frequency-domain results”.

Claims 2-7 stand allowable as depending directly from allowable Claim 1 and by including further limitations not taught or suggested by the reference of record. Claims 9-14 stand allowable as depending directly from allowable Claim 8 and by including further limitations not taught or suggested by the reference of record.

Claim 2 further defines the architecture as recited in Claim 1 wherein each of said plurality of data-independent pipelines receives a single time-domain data sample at a time. Claim 2 depends from Claim 1 and is therefore allowable for the same reasons set forth above for the allowance of Claim 1.

Claim 3 further defines the architecture as recited in Claim 1 wherein each of said data-independent pipelines is a radix-2² single-path delay feedback pipeline. Claim 3 depends from Claim 1 and is therefore allowable for the same reasons set forth above for the allowance of Claim 1.

Claim 4 further defines the architecture as recited in Claim 1 wherein said parallel segment is a radix-2 segment. Claim 4 depends from Claim 1 and is therefore allowable for the same reasons set forth above for the allowance of Claim 1.

Claim 5 further defines the architecture as recited in Claim 1 wherein a number of said plurality of data-independent pipelines for a particular application is based on both a time-domain data sample rate and a clock rate pertaining to said application. Claim 5 depends from Claim 1 and is therefore allowable for the same reasons set forth above for the allowance of Claim 1.

Claim 6 further defines the architecture as recited in Claim 1 wherein a strength reduction transformation is employed to substitute real multipliers for complex multipliers. Claim 6 depends from Claim 1 and is therefore allowable for the same reasons set forth above for the allowance of Claim 1.

Claim 7 further defines the architecture as recited in Claim 1 wherein said pipeline segment employs a hardware implementation. Claim 7 depends from Claim 1 and is therefore allowable for the same reasons set forth above for the allowance of Claim 1.

Claim 9 further defines the method as recited in Claim 8 wherein each of said plurality of data-independent pipelines receives a single time-domain data sample at a time. Claim 9 depends from Claim 1 and is therefore allowable for the same reasons set forth above for the allowance of Claim 1.

Claim 10 further defines the method as recited in Claim 8 wherein each of said data-independent pipelines is a radix-2² single-path delay feedback pipeline. Claim 10 depends from Claim 1 and is therefore allowable for the same reasons set forth above for the allowance of Claim 1.

Claim 11 further defines the method as recited in Claim 8 wherein said parallel segment is a radix-2 segment. Claim 11 depends from Claim 1 and is therefore allowable for the same reasons set forth above for the allowance of Claim 1.

Claim 12 further defines the method as recited in Claim 8 wherein a number of said plurality of data-independent pipelines for a particular application is based on both a time-domain data sample rate and a clock rate pertaining to said application. Claim 12 depends from Claim 1 and is therefore allowable for the same reasons set forth above for the allowance of Claim 1.

Claim 13 further defines the method as recited in Claim 8 wherein a strength reduction transformation is employed to substitute real multipliers for complex multipliers. Claim 13 depends from Claim 1 and is therefore allowable for the same reasons set forth above for the allowance of Claim 1.

Claim 14 further defines the method as recited in Claim 8 wherein said pipeline segment employs a hardware implementation. Claim 2 depends from Claim 1 and is therefore allowable for the same reasons set forth above for the allowance of Claim 1.

3) Claims 15-21 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Jaber [US 6,792,441] or Nakazuru [US 2004/0039765 A1] and Nakai et al [US 6,115,728]. Applicants respectfully traverse this rejection, as set forth below.

In proceedings before the Patent and Trademark Office, “the Examiner bears the burden of establishing a prima facie case of obviousness based upon the prior art”. *In re Fritch*, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992) (citing *In re Piasecki*, 745 F.2d 1468, 1471-72, 223 USPQ 785, 787-88 (Fed. Cir. 1984). “The Examiner can satisfy this burden **only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references**”, *In re Fritch*, 23 USPQ2d 1780,

1783 (Fed. Cir. 1992)(citing *In re Fine*, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988)(citing *In re Lalu*, 747 F.2d 703, 705, 223 USPQ 1257, 1258 (Fed. Cir. 1988)).

Similarly, "obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, **absent some teaching or suggestion supporting the combination. Under section 103, teachings of references can be combined ONLY if there is some suggestion or incentive to do so.**" *ACS Hosp. Systems, Inc. v. Montefiore Hosp.*, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984).

Similarly, although couched in terms of combining teachings found in the prior art, the same inquiry must be carried out in the context of a purported obvious "modification" of the prior art. **The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification.** *In re Gordon*, 733 F.2d at 902, 221 USPQ at 1127. Moreover, it is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. *In re Gorman*, 933 F.2d 982, 987, 18 USPQ2d 1885, 1888 (Fed.Cir.1991). See also *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1138, 227 USPQ 543, 547 (Fed.Cir.1985).

Independent Claim 15 requires and positively recites, **an Orthogonal Frequency Division Multiplex (OFDM) receiver, comprising: "an input section that is coupled to a receive antenna", "a fast Fourier transform (FFT) section that is coupled to said receive section, including: a pipeline segment having a plurality of data-independent pipelines that receive different time-domain data samples and generate therefrom corresponding intermediate results, and a parallel segment, coupled to all of said**

pipelines, that receives said corresponding intermediate results and **generates therefrom corresponding frequency-domain results**” and “**an output section that is coupled to said FFT section**”.

Applicant respectfully points out that the Examiner has failed to present a prima facie case of obviousness of Claim 15. No evidence whatsoever has been identified and presented by the Examiner that the cited references teach the above-high lighted elements of Claim 15, as is required by law. There is no teaching in the Jaber, Nakazuru and/or Nakai references that suggest any of the above high-lighted elements of Claim 15. Moreover, **it is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious.** *In re Gorman*, 933 F.2d 982, 987, 18 USPQ2d 1885, 1888 (Fed.Cir.1991). See also *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1138, 227 USPQ 543, 547 (Fed.Cir.1985). Accordingly, the 35 U.S.C. 103(a) rejection of Claim 15 must be withdrawn.

Claims 16-21 stand allowable as depending directly from allowable Claim 1 and by including further limitations not taught or suggested by the reference of record.

Claim 16 further defines the receiver as recited in Claim 15 wherein each of said plurality of data-independent pipelines receives a single time-domain data sample at a time. Claim 16 depends from Claim 15 and is therefore allowable for the same reasons set forth above for the allowance of Claim 15.

Claim 17 further defines the receiver as recited in Claim 15 wherein each of said data-independent pipelines is a radix-2² single-path delay feedback pipeline. Claim 17 depends from Claim 15 and is therefore allowable for the same reasons set forth above for the allowance of Claim 15.

Claim 18 further defines the receiver as recited in Claim 15 wherein said parallel segment is a radix-2 segment. Claim 18 depends from Claim 15 and is therefore allowable for the same reasons set forth above for the allowance of Claim 15.

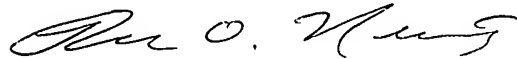
Claim 19 further defines the receiver as recited in Claim 15 wherein a number of said plurality of data-independent pipelines for a particular application is based on both a time-domain data sample rate and a clock rate pertaining to said application. Claim 19 depends from Claim 15 and is therefore allowable for the same reasons set forth above for the allowance of Claim 15.

Claim 20 further defines the receiver as recited in Claim 15 wherein a strength reduction transformation is employed to substitute real multipliers for complex multipliers. Claim 20 depends from Claim 15 and is therefore allowable for the same reasons set forth above for the allowance of Claim 15.

Claim 21 further defines the receiver as recited in Claim 15 wherein said pipeline segment employs a hardware implementation. Claim 20 depends from Claim 15 and is therefore allowable for the same reasons set forth above for the allowance of Claim 15.

Claims 1-21 stand allowable over the cited art. Applicant respectfully requests withdrawal of the rejections and allowance of the application at the earliest possible date.

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "Ron O. Neerings".

Ronald O. Neerings
Reg. No. 34,227
Attorney for Applicant

TEXAS INSTRUMENTS INCORPORATED
P.O. BOX 655474, M/S 3999
Dallas, Texas 75265
Phone: 972/917-5299
Fax: 972/917-4418